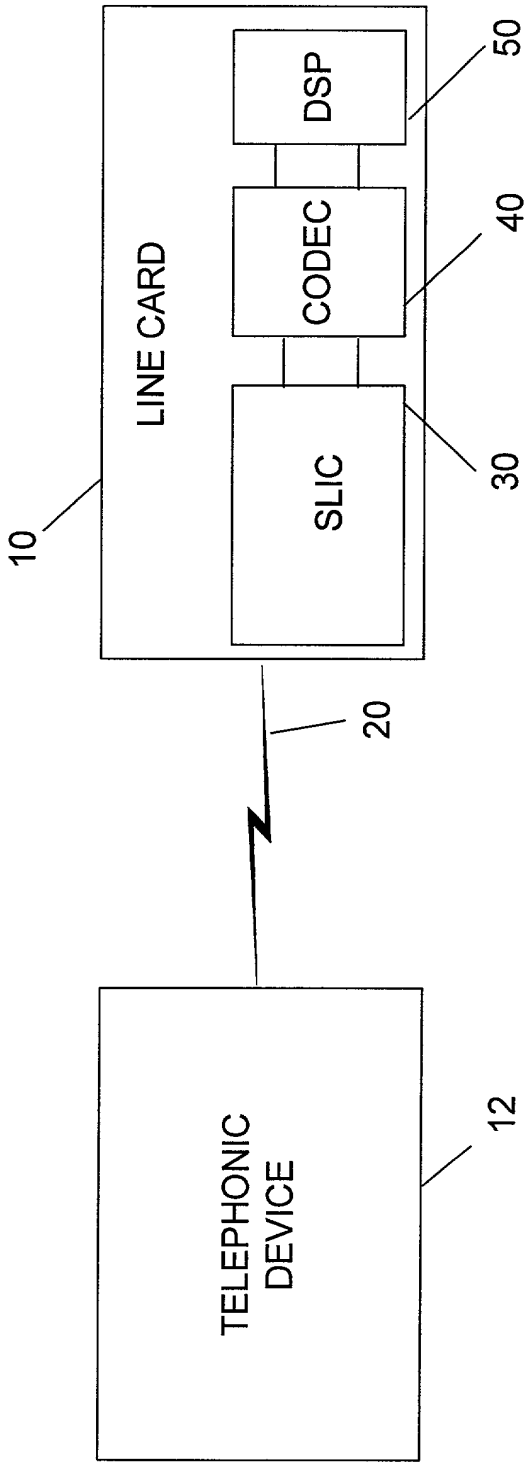

FIG. 1

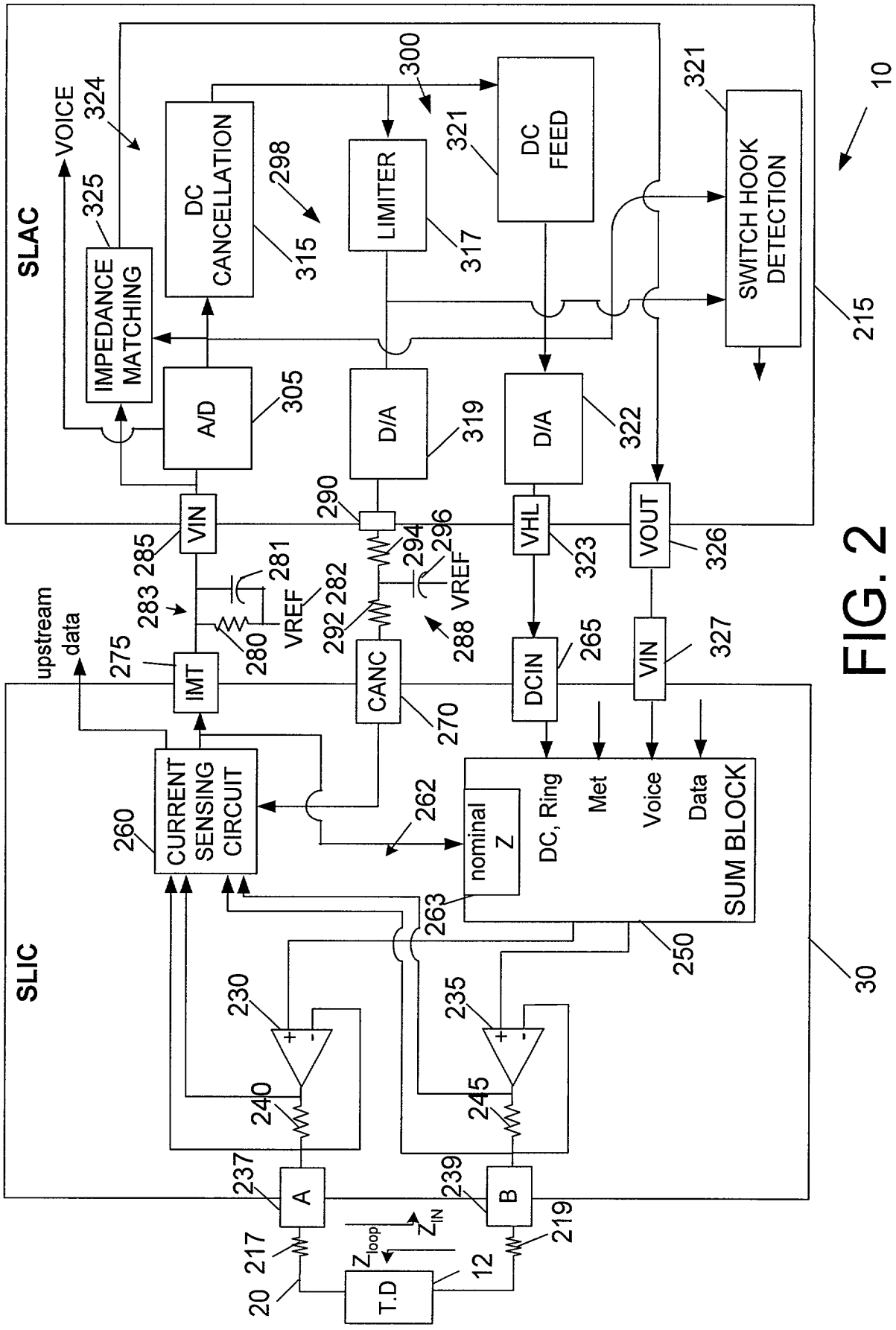
SLAC
SLIC
VOICE
IMPEDANCE MATCHING
DC CANCELLATION
LIMITER
DC FEED
SWITCH HOOK DETECTION
A/D
D/A
D/A
VIN
VHL
VOUT
IMT
CANC
DCIN
VIN
upstream data
CURRENT SENSING CIRCUIT
nominal Z
DC, Ring
Met
Voice
Data
SUM BLOCK
A
B
T.D
VREF
VREF
Z_{loop}
Z_{IN}
10
12
20
30
215
217
219
230
235
237
239
240
245
250
260
262
263
270
275
280
281
283
285
288
290
292
294
296
298
300
305
315
317
319
321
321
322
323
324
325
326
327

FIG. 2

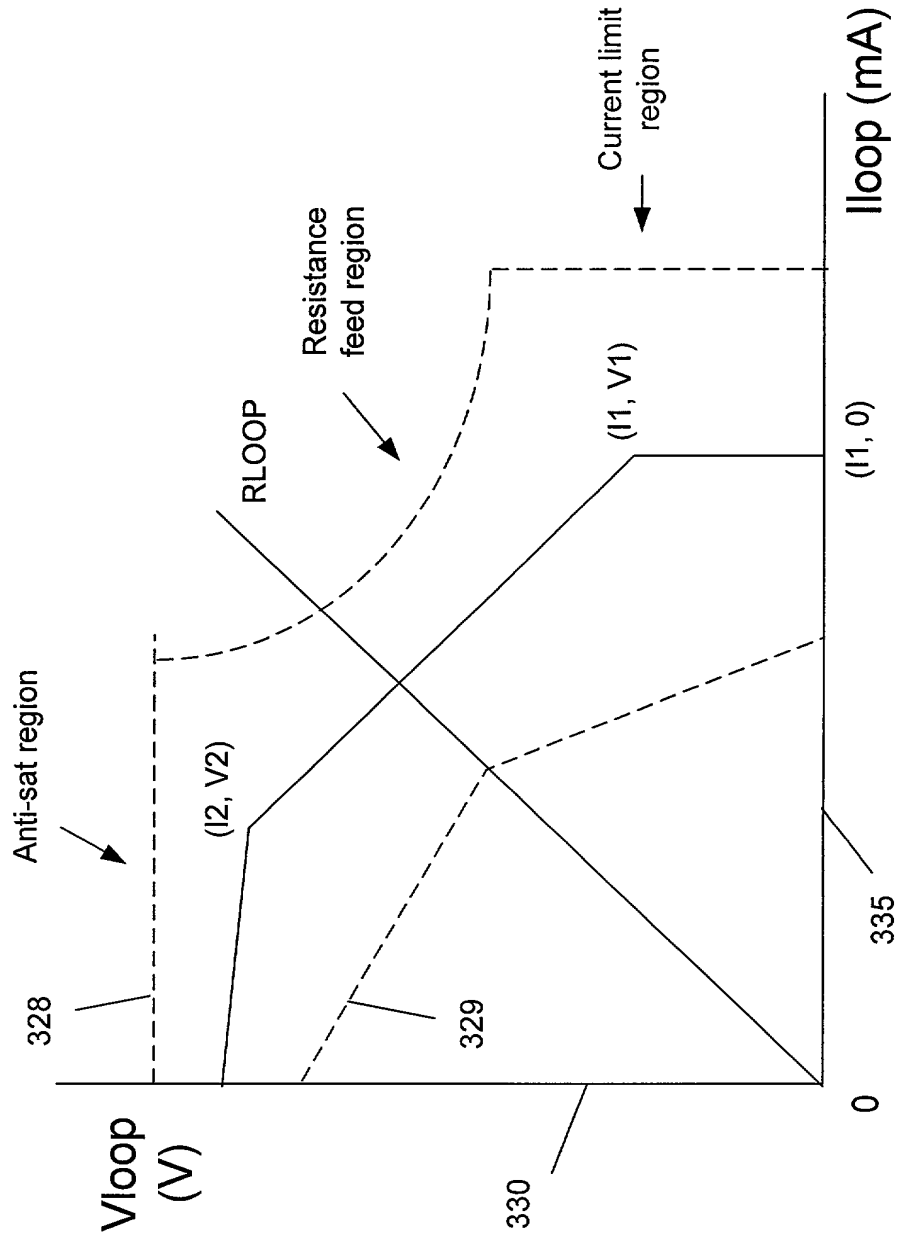
Vloop (V)
Iloop (mA)
Anti-sat region
Resistance feed region
Current limit region
RLOOP
(I2, V2)
(I1, V1)
(I1, 0)
328
329
330
335
0

FIG. 3

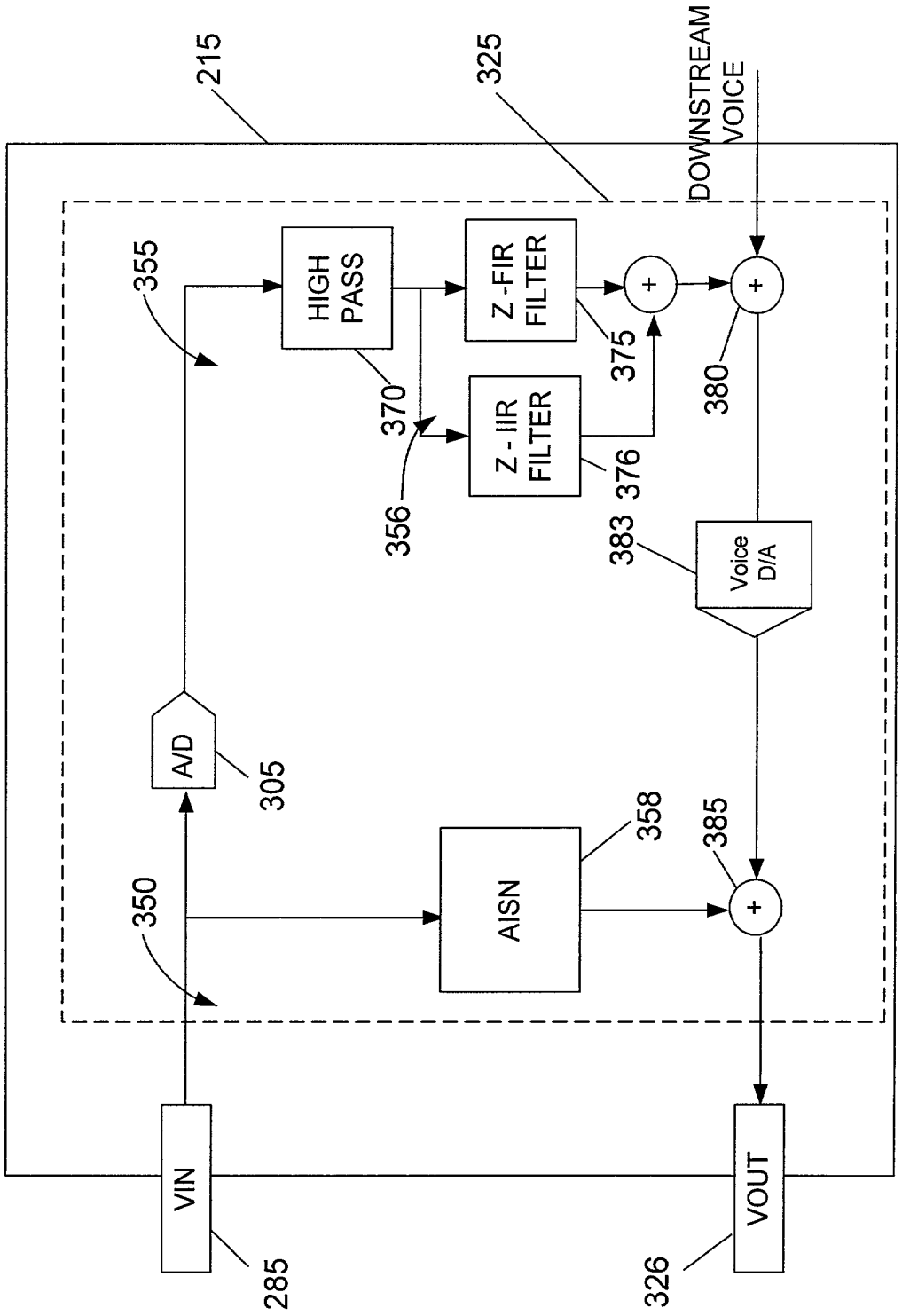
215
325
DOWNSTREAM VOICE
355
HIGH PASS
Z -FIR FILTER
375
380
370
Z - IIR FILTER
376
356
383
Voice D/A
A/D
305
350
AISN
358
385
VIN
285
VOUT
326

FIG. 4

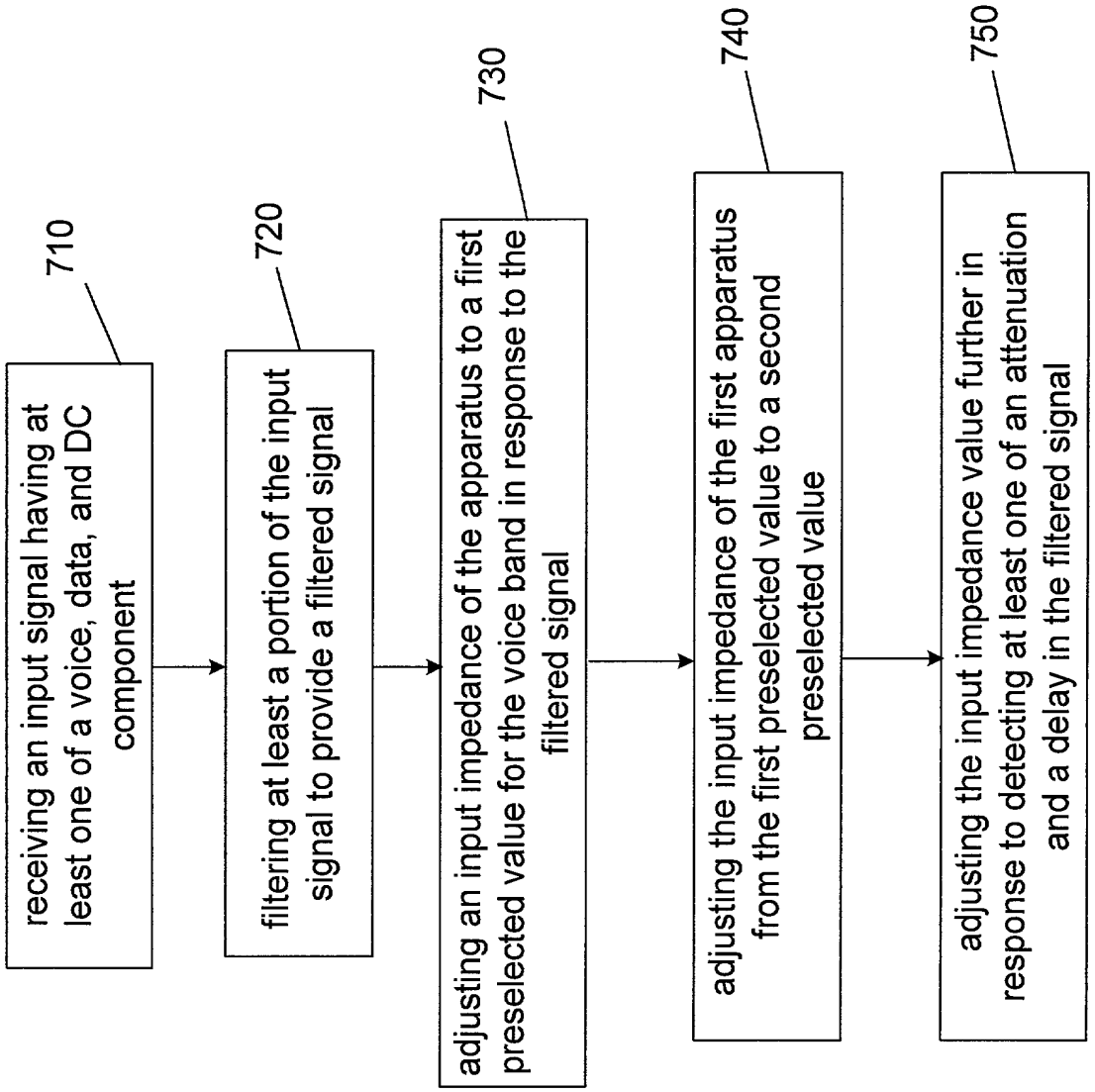
710
receiving an input signal having at least one of a voice, data, and DC component
720
filtering at least a portion of the input signal to provide a filtered signal
730
adjusting an input impedance of the apparatus to a first preselected value for the voice band in response to the filtered signal
740
adjusting the input impedance of the first apparatus from the first preselected value to a second preselected value
750
adjusting the input impedance value further in response to detecting at least one of an attenuation and a delay in the filtered signal

FIGURE 5